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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,394	07/27/2006	Shuuichi Ishizuka	294256US26PCT	7155

22850 7590 07/08/2009

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
MILLER, JR, JOSEPH ALBERT	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
07/08/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/587,394	ISHIZUKA ET AL.	
	Examiner	Art Unit	
	JOSEPH MILLER JR	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,12,14-16 and 18-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,12,14-16 and 18-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1 -3, 12, 14-16, 18-25 are objected to because of the following informalities: claims 1 and 12 states the limitation "chamber that does not accommodate the target substrate". The claim language may imply a chamber that is not able to accommodate the target substrate. For clarity, the claim should be rewritten in a manner to convey that the target substrate is merely not present.

Additionally, claims 1 and 12 include "wherein the cleaning cycle alternately includes", which, as written, would seem the rest of the sentence is one possible method of cleaning the chamber and a number method would be presented. The claim will be examined as meaning the cycle includes the alternating steps as described.

Appropriate correction is required.

Claim Observations

Claims written as "consisting essentially of" do not particularly limit the composition of the mixture gases as stated. See MPEP 2111.03 [R-3] concerning transitional phrases, included below. The "consisting essentially of" may limit the inclusion of gases that would, for example, deposit a film but there is no reason to limit prior art that teaches etch/chamber cleaning steps.

The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and

novel characteristic(s)" of the claimed invention. In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original) (Prior art hydraulic fluid required a dispersant which appellants argued was excluded from claims limited to a functional fluid "consisting essentially of" certain components. In finding the claims did not exclude the prior art dispersant, the court noted that appellants' specification indicated the claimed composition can contain any well-known additive such as a dispersant, and there was no evidence that the presence of a dispersant would materially affect the basic and novel characteristic of the claimed invention. The prior art composition had the same basic and novel characteristic (increased oxidation resistance) as well as additional enhanced detergent and dispersant characteristics.). "A consisting essentially of' claim occupies a middle ground between closed claims that are written in a consisting of' format and fully open claims that are drafted in a comprising' format." PPG Industries v. Guardian Industries, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also Atlas Powder v. E.I. duPont de Nemours & Co., 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); In re Janakirama-Rao, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); Water Technologies Corp. vs. Calco, Ltd., 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., PPG, 156 F.3d at 1355, 48 USPQ2d at 1355 ("PPG could have defined the scope of the phrase consisting essentially of' for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention."). See also AK Steel Corp. v. Sollac, 344 F.3d 1234, 1240-41, 68 USPQ2d 1280, 1283-84 (Fed. Cir. 2003) (Applicant's statement in the specification that "silicon contents in the coating metal should not exceed about 0.5% by weight" along with a discussion of the deleterious effects of silicon provided basis to conclude that silicon in excess of 0.5% by weight would materially alter the basic and novel properties of the invention. Thus, "consisting essentially of" as recited in the preamble was interpreted to permit no more than 0.5% by weight of silicon in the aluminum coating.); In re Janakirama-Rao, 317 F.2d 951, 954, 137 USPQ 893, 895-96 (CCPA 1963). If an applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of," applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention. In re De Lajarte, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See also Ex parte Hoffman, 12 USPQ2d 1061, 1063-64 (Bd. Pat. App. & Inter. 1989) ("Although consisting essentially of' is typically used and defined in the context of compositions of matter, we find nothing intrinsically wrong with the use of such language as a modifier of method steps. . . [rendering] the claim open only for the inclusion of steps which do not materially affect the basic and novel characteristics of the claimed method. To determine the steps included versus excluded the claim must be read in light of the specification. . . . [I]t is an applicant's burden to establish that a step practiced in a prior art method is excluded from his claims by consisting essentially of' language.").

Limitations are not added such that the plural cycles required in instant claims must take part between one substrate process, if that is the intent (i.e. the claim reads on teachings where a nitriding/oxidizing process may be performed, cleaning cycles, nitriding/oxidizing, cleaning cycles – the plural cleaning cycles are not required to be back-to-back plural between a nitriding/oxidizing process).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen (2005/0133059).

Chen teaches a method of cleaning a PECVD chamber (abstract). Chen teaches the cleaning of a chamber with a predetermined process including oxiding and/or nitriding processes [0022]. Chen teaches a cleaning cycle where an oxygen and argon plasma are applied as a first step [0019], followed by an argon-based plasma which ca contain nitrogen [0020]. It is noted that Chen teaches an embodiment wherein preferentially no nitrogen is included in the argon plasma, but in reading further [0025-26] it appears that some amount of nitrogen in the argon plasma would be plausible.

Regarding the limitation of repeating the cycle, Chen teaches that it is known to perform the deposition process several times [0002]. It would be inherent that the process is meant to be repeated after the last step of the cycle, as per Fig. 2, or, in alternative, it would be obvious to apply the cleaning cycle again after another substrate has been processed via deposition.

It is noted that the claim is 'comprising' and therefore allows for additional steps.

Claims 12 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (2005/0133059) in view of Frankel (2002/0073922).

The teachings of Chen are taught as applied above to claim 1 and will not be repeated here; Chen teaches a chamber cleaning process and teaches that the use of chamber seasoning is know, but does not teach a seasoning process following the cleaning before installing the substrate.

Frankel teaches a method of performing multiple steps in-situ in the same process chamber (abstract) including the deposition of films such as undoped silicate glass [0002]. Frankel teaches the use of a pre-deposition seasoning process [0252, 0258] where TEOS and ozone or oxygen are flowed to create a predeposition layer prior to the TEOS-ozone oxidizing process to form undoped silicate glass [0253].

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the preseasoning step (including the flow of an oxygen-containing gas plasma) as taught by Frankel to the precleaning plus deposition method taught by Chen because the seasoning step may reduce particle formation and F

content. Chen is interested in minimizing reactions with fluorine [0008], thereby the seasoning process would be obvious to add to further reduce the F residues.

Regarding claim 23, the process (including plasma) time is a results effective variable – in a deposition (seasoning) process, the longer period of time, the thicker the deposited layer will be, in an etch process, the longer the etch gases/plasma will be exposed to the etch surface. Either one of these process times is therefore subject to optimization, based upon the build-up in the chamber to be etched and/or the other chamber process conditions and, in the case of seasoning, the desired thickness of the seasoning film. A plasma generation time longer in a seasoning process than in an etch process would be a matter of process optimization.

Regarding claim 24, Chen teaches the use of exhaust on the system [0018] and exhausting plasma; as Chen teaches an oxygen followed by an argon plasma process, it would have been obvious to someone of ordinary skill in the art at the time of the invention to exhaust the process chamber between steps in order to form the concrete steps as described.

Regarding claim 25, Chen but does not specifically teach use of an inactive gas during the step. Examiner is taking Official Notice concerning claim 20 that the use of an inactive (or inert) gas during a chamber evacuation step was well-known to one of ordinary skill in the art at the time of the invention. The use of the inactive gas would assist in purging contents during the specifically taught evacuation step.

Claims 1 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321).

Shrotriya teaches a process for the cleaning of a deposition chamber using a two step cleaning process (abstract). Shrotriya teaches applying, to a gas comprising oxygen in a first step including application of plasma (col 3, line 54-col 4, line 7). The second step uses a plasma which may include nitrogen gas (col 4, lines 8-23). The use of ozone meets the limitation of oxygen gas – since ozone is triatomic oxygen (versus diatomic oxygen) and applicants do not disclose that ozone would materially affect the results of an oxygen source. The predetermined is a CVD process, such as the oxidation of TEOS to form silicon dioxide (col 9, lines 17-44). The process of forming silicon dioxide with oxygen present is an oxidizing process.

Regarding the application of the cycle a plurality of time, Shrotriya teaches that chamber cleaning between every N wafers is known (col 2, lines 1-3).

While Shrotriya teaches the use of oxygen and nitrogen containing gases, respectively, there is no teaching of adding argon into the etch process gases.

Cui teaches a plasma chamber cleaning method for deposition chamber (abstract). Cui teaches that argon may be used to effect a sputtering element to the etch process [0019]. It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of Ar to the plasma cleaning steps of Shrotriya as one could apply the use of Ar with the plasma cleaning steps with a reasonable expectation of success in providing a sputtering effect based on Cui's successful use of Ar for its sputtering effect added to a clean of a deposition chamber.

Though Cui teaches the use of argon or oxygen can have the sputtering effect, it would be nonetheless obvious to one of ordinary skill to add a second gas or use a mixture gas which would produce the same cumulative effect of the single (i.e. oxygen) gas. Shrotriya actually teaches the use of ozone (oxygen containing gas) for its reactivity and not specifically for its sputtering effect (col 3, lines 55-67).

Regarding claim 18, Shrotriya teaches the limitations of claim 1 but is silent on the length of time of either the nitrogen or oxygen containing gas cleaning cycles. It would have been obvious to someone of ordinary skill in the art at the time of the invention to optimize the cleaning process and apply each step for the length of time needed to appropriately clean the chamber, including the condition where the second process is performed for a period longer than the former operations. Additionally, the time for any given process is impacted and controlled by a number of values including but not limited to the plasma power, temperature and gas flow rates, all which are a matter of standard process optimization well known to those of ordinary skill in the art.

As noted per claim 1, Shrotriya teaches repeating of the cycle between substrates; when applying the cycle more than 2 times, which is encompassed in "N" times as noted by Shrotriya (col 2, lines 1-3), on the next cleaning cycle there will be a "final" period of using a plasma of one or other of the gases (there is no instant limitation of the process required for the gases).

Regarding claim 19, Shrotriya teaches that the gaseous by-products are evacuated after the first cleaning step (col 4, lines 5-7).

Regarding claim 20, Shrotriya teaches that the by-products are removed between the two cleaning steps by evacuation (col 4, lines 5-8) but does not specifically teach use of an inactive gas during the step. Examiner is taking Official Notice concerning claim 20 that the use of an inactive (or inert) gas during a chamber evacuation step was well-known to one of ordinary skill in the art at the time of the invention. The use of the inactive gas would assist in purging contents during the specifically taught evacuation step. Regarding the specification of argon, Shrotriya teaches argon as an exemplary inert gas (col 9, lines 17-20), though teaching in context of a deposition process, it is related to argon's use for chamber stabilization which could be applicable to any process, including an etch process. Furthermore, the continuation of Ar between the etch process steps would allow for the pressure to remain stabilized and have further sputtering effect as taught by Cui.

Claims 12 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321) and Frankel (2002/0073922).

The teachings of Shrotriya in view of Cui are taught as applied above to claim 1 and will not be repeated here. The combined teaching does not teach a seasoning process following the cleaning before installing the substrate.

Frankel teaches a method of performing multiple steps in-situ in the same process chamber (abstract) including the deposition of films such as undoped silicate glass [0002]. Frankel teaches the use of a pre-deposition seasoning process [0252,

0258] where TEOS and ozone are flowed to create a predeposition layer prior to the TEOS-ozone oxidizing process to form undoped silicate glass [0253].

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the preseasoning step (including the flow of an oxygen-containing gas plasma) as taught by Frankel to the precleaning plus deposition method taught by Shrotriya because it would help in reducing particle formation [0252].

(It should be noted that Frankel teaches that the seasoning step may reduce particle formation **and** F content. It would be (alternatively) possible that the F reducing nature of the seasoning layer would be beneficial to the process of Shrotriya, because Shrotriya's process teaches "reducing or eliminating" cleaning residues (col 3, lines 18-20), thereby the seasoning process would be obvious to add to further reduce the F residues, however, the reference to Frankel is not relied upon for that reason but rather for its properties of reducing particles).

Regarding claim 23, the process (including plasma) time is a results effective variable – in a deposition (seasoning) process, the longer period of time, the thicker the deposited layer will be, in an etch process, the longer the etch gases/plasma will be exposed to the etch surface. Either one of these process times is therefore subject to optimization, based upon the build-up in the chamber to be etched and/or the other chamber process conditions and, in the case of seasoning, the desired thickness of the seasoning film. A plasma generation time longer in a seasoning process than in an etch process would be a matter of process optimization.

Regarding claim 24, Shrotriya teaches that the gaseous by-products are evacuated after the first cleaning step (col 4, lines 5-7).

Regarding claim 25, Shrotriya teaches that the by-products are removed between the two cleaning steps by evacuation (col 4, lines 5-8) but does not specifically teach use of an inactive gas during the step. Examiner is taking Official Notice concerning claim 20 that the use of an inactive (or inert) gas during a chamber evacuation step was well-known to one of ordinary skill in the art at the time of the invention. The use of the inactive gas would assist in purging contents during the specifically taught evacuation step. Regarding the specification of argon, Shrotriya teaches argon as an exemplary inert gas (col 9, lines 17-20), though teaching in context of a deposition process, it is related to argon's use for chamber stabilization which could be applicable to any process, including an etch process. Furthermore, the continuation of Ar between the etch process steps would allow for the pressure to remain stabilized and have further sputtering effect as taught by Cui.

Claims 2, 3 and 15 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321) as applied to claim 1 above and over Shrotriya (6,068,729) in view of Cui (2004/0000321) and Frankel (2002/0073922) as applied to claim 12 above, respectively, and in further view of Nakaune (2001/0017190) and Bailey, III (2003/0047140).

The teachings of Shrotriya in view Cui and Frankel are described above.

Shrotriya in view of Cui and Frankel does not teach the use of a plasma wherein the electron temperature is 2eV or less or an antenna facing the substrate.

Nakaune teaches a method of using an etch gas in a semiconductor chamber [0002]. Nakaune teaches the use of an antenna to generate a plasma [0013,0014] wherein the plasma has an electron temperature of 0.25 eV to 1 eV.

Bailey teaches a method of generating plasma using an antenna [0013] and discusses the interaction of the plasma with the chamber walls [0018].

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the method of generating plasma that is between 0.25 and 1 eV using an antenna as taught by Nakaune to the cleaning, seasoning and deposition process of Shrotriya in view of Frankel as one could apply the electron temperature range taught Nakaune with a reasonable expectation of generating an etching plasma based on Nakaune's successful use of an antenna to generate plasma at an electron temperature of 0.25 to 1.0 eV. Though Shrotriya is not silent on the plasma generation method, he teaches that the cleaning process is not limited to the method discussed (col 10, lines 38-41). It is further evident from Bailey that keeping the electron temperature low will aide in minimizing the plasma damage to the chamber walls [0018].

The plasma taught by Nakaune contains nitrogen gas [0020], however, it would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the plasma generation method to either the oxygen and/or nitrogen plasmas of Shrotriya because one would be concerned with damage to the chamber walls in either case. Though the method of Nakaune is directed to etching substrates, the teachings of

Nakaune in view of Bailey would provide reason for one of ordinary skill to use a plasma with a lower electron temperature as the impact discussed is in regards to the chambers walls, which would be of great interest to one seeking to clean the chamber walls.

Regarding the limitation that the antenna is disposed on the process chamber to face the target substrate, both Nakaune and Bailey teach such a configuration, Nakaune (Fig. 1) shows such an antenna (6) and substrate (12) and chamber (1) and Bailey shows that the same is known in the art (Fig. 1), where the antenna (104), substrate (112) and process chamber (100) are depicted. Therefore it would have been obvious to use such a configuration in the process of Shrotriya based on Nakaune and Bailey's successful use of the configuration to create a plasma; one seeking to use the method of Shrotriya would necessarily look to the prior art for configuration due to Shrotriya's (noted) silence on the method of plasma generation.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321) and Frankel (2002/0073922) as applied to claim 12 and in further view of Ishikawa (2001/0031321) and Lee (2002/0045966).

The teachings of Shrotriya in view of Cui and Frankel are described. The combined teaching does not teach a seasoning process that specifically uses the mixture gas in the seasoning process; Frankel teaches the use of a plasma process for the deposition of a TEOS chamber seasoning film [0258] but the inclusion of Ar or N2 is not taught.

Ishikawa teaches that when forming an oxide film it is known to apply gases such as oxygen, nitrogen and argon with the plasma and then add TEOS [0005]. The inclusion of nitrogen with a plasma inherently causes a "nitriding" process.

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of argon and nitrogen to the oxygen plasma of Frankel as it would be a known, conventional manner with which to form the TEOS film.

The combined teachings support a nitriding process as the predetermined process, but do not teach the use of the second mixture gas for the seasoning layer.

Lee teaches a chamber seasoning process for a TEOS film [0037-39]. Lee teaches that the same process conditions (except for process time) are used for the seasoning as for the substrate film deposition in order to ensure a pure environment.

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of a seasoning film the same as the predetermined process film as taught by Lee with the cleaning, seasoning and deposition of Shrotriya (et al) as it would ensure a pure environment for the predetermined process; Shrotriya is clearly concerned with the condition of the chamber as evidenced by the multiple cleaning steps.

Though the entirety of the first cleaning gas of Shrotriya includes a gas that is not used in the plasma process of Frankel, there is no limitation on what may be considered the "mixture gas". Since argon and nitrogen are taught, that could be considered the 'mixture gas' with the oxygen gas of Frankel and the fluorine gas of Shrotriya being

considered a gas additional to the mixture gas. Instant claims do not preclude the use of additional gases beyond the 'mixture gas' for the cleaning process.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321) and Frankel (2002/0073922) as applied to claim 12 and in further view of Ishikawa (2001/0031321).

The teachings of Shrotriya in view of Cui and Frankel are described. The combined teaching does not teach a seasoning process that specifically uses the mixture gas in the seasoning process; the plasma gas taught by Frankel is oxygen [0258] but the inclusion of Ar is not taught.

Ishikawa teaches that when forming an oxide film it is known to apply gases such as oxygen and argon with the plasma and then add TEOS [0005].

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of argon to the oxygen plasma of Frankel as it would be a known, conventional manner with which to form the oxide film.

Though the entirety of the first cleaning gas of Shrotriya includes a gas that is not used in the plasma process of Frankel, there is no limitation on what may be considered the "mixture gas". Since argon and oxygen are taught, that could be considered the 'mixture gas' with the fluorine gas of Shrotriya being considered a gas additional to the mixture gas. Instant claims do not preclude the use of additional gases beyond the 'mixture gas' for the cleaning process.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shrotriya (6,068,729) in view of Cui (2004/0000321) and Frankel (2002/0073922) as applied to claim 12 and in further view of Narwankar (2001/0001175).

The teachings of Shrotriya in view of Cui and Frankel are described. The combined teachings do not teach the use of a dummy wafer during cleaning and/or seasoning processes.

Narwankar teaches that it is known to apply the use of a dummy wafer to protect a chuck during a plasma clean process [0051].

It would have been obvious to someone of ordinary skill in the art at the time of the invention to apply the use of a dummy wafer as taught by Narwankar to protect the chuck in the process of Shrotriya in view of Cui and Frankel in order to protect the chuck. Shrotriya teaches the use of a susceptor (col 5, lines 1-10), however, it would be obvious to apply the protection taught by Narwankar to any wafer-holder used in a plasma system. Examiner is taking official notice that it would be further obvious to apply the use of the dummy wafer during the seasoning step. Though Frankel doesn't teach the need to cover the pedestal, unless a film is specifically required on the wafer holder, it would be obvious to those of ordinary skill that it may be undesirable in some embodiments. Frankel specifically teaches, in fact, concern with protecting (i.e. cleaning and seasoning) the chamber walls [0252].

Response to Arguments

The objection over claim 19 and 112 rejection of claim 15 have been removed due to applicant's amendment.

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant amended claims to include argon in the mixture gas to etch the chamber in the cleaning cycle. The inclusion of Ar in a chamber clean is known in the art, as indicated by the inclusion of the Cui reference in the current amended rejection. Applicant's inclusion of argon has overcome the previous 102 rejection. It is noted that the Cui reference could have been added to any of the previous 102 rejections, however it was not re-applied as it did not further the prosecution of the case. Further changes by applicant could make any of those previously applied references more applicable than the Shrotriya reference used in this rejection.

It is further noted that "consisting essentially of" is read similarly to comprising. Furthermore, the instant claim language is "comprising" such that even if the "mixture gas" were restricted, it would not restrict the prior art from teaching a "mixture gas" **and** an additional cleaning gas (per MPEP as noted above in Claim Observations).

Independent claims have been argued in reference only to the primary reference/rejection and the combination of the prior art not teaching the *amended* claims, therefore will not be further addressed.

Regarding claim 12, applicant argues that Frankel does not teach a plasma to deposit the seasoning layer. Examiner directed applicant to the section teaching the

seasoning layer, however, unfortunately not to the specific section stating the use of a plasma process. It is further noted herein that Frankel teaches the use of plasma in depositing the seasoning layer [00258] and it is in the same general section of the PG Pub wherein the seasoning layer was disclosed. Furthermore, examiner pointed out in the office action (last full paragraph on page 9) that Frankel does teach an oxygen-containing gas plasma.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Deshmukh (2004/0084409) teaches that a dummy wafer will help protect a chuck during a chamber cleaning and seasoning steps [0033].

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH MILLER JR whose telephone number is (571) 270-5825. The examiner can normally be reached Mon - Thurs, 7am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/JOSEPH MILLER JR/
Examiner, Art Unit 1792

/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1792